Federal R&D Funding by Budget Function

Fiscal Years 1997-99

An SRS Special Report

Division of Science Resources Studies
Directorate for Social, Behavioral, and Economic Sciences

National Science Foundation

December 1998

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NOTES TO THE READER

This annual report contains information on Federal funding of the research and development (R&D) components of agency programs, as proposed by the administration for fiscal year (FY) 1999. R&D data in this report are classified into the same Federal budget function categories used in the *Budget of the United States Government, Fiscal Year 1999*. Proposed FY 1999 funding levels are for budget authority (defined below), which is the basis for initial congressional action. In future *Budget Function* reports, these data will be revised to reflect congressional appropriation and actual program funding decisions. Detailed data are included on *preliminary* estimates for Federal funding of R&D in FY 1999 that reflect all past congressional actions, but may be revised since, at the time of report preparation FY 1998 had not yet been completed. This report also includes detailed data (by subfunction) on actual budget authorizations of R&D by Federal agencies in FY 1997 and aggregate data (by broad function) on actual R&D budget authorizations in FY 1997 and earlier years.

Although the Federal budget discussed in this report has been available for several months, it is still useful to look at those numbers in a concise format. Publication of this report was delayed to allow a few agencies to resolve certain detailed budget items presented in the text and tables. National Science Foundation (NSF) viewed this information as a critical part of the report.

REPORT ORGANIZATION

These notes introduce the basic budget terms and concepts used in this report. The rest of the report is divided into three sections:

Research and Development in the 1999 Budget: An Overview provides an overview of Federal funding of R&D within the context of requested total Federal budget authority. This section consists of five tables. Tables 1, 2, 4, and 5 provide an overview of Federal R&D funding within the context of requested total Federal budget authority. Table 3 details Federal R&D funding for national defense and civilian programs in current and constant 1992 dollars for FYs 1955–99.

R&D by Specific Budget Function Tables presents data on R&D activities conducted within each budget function. This section consists of 19 tables (tables 6 through 24) which provide a summary for FYs 1997–99.

Historical Tables presents two historical data series: (1) Federal R&D funding by function for FYs 1955–96 (tables 25a through 25g) and (2) Federal funding of basic research for FYs 1978–99 (tables 26a through 26c).

DEFINITIONS

Research and Development

As used in this report, R&D refers to research—both basic and applied—and development activities in the sciences and engineering.

Research is a systematic study directed toward fuller scientific knowledge or understanding of the subject studied. Research is classified as either basic or applied according to the objective of the sponsoring agency.

- In **basic research** the objective of the sponsoring agency is to gain fuller knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications toward processes or products in mind.

- In **applied research** the objective of the sponsoring agency is to gain knowledge or understanding necessary for determining means by which a recognized and specific need may be met.

Development is the systematic use of the knowledge or understanding gained from research directed toward the production of useful materials, devices, systems, or methods, including design, development, and improvement of prototypes and new processes. It excludes quality control, routine product testing, and production.

Funds for conducting R&D include those for personnel, program supervision, and administrative support directly associated with R&D activities. Expendable or movable equipment needed to conduct R&D—e.g., microscopes or spectrometers—is also included.

This report does not include data on R&D plant funds—i.e., funds for R&D facilities such as reactors, wind tunnels, or particle accelerators or for the construction, repair, or alteration of such facilities. Also excluded are all non-R&D activities performed within budget functions that conduct R&D and all functions in which no R&D is conducted.

Budget Authority, Obligations, and Outlays

The Federal R&D funding data presented here are, with a few noted exceptions, provided in budget authority. Budget authority is used because it is the initial budget parameter for congressional action on the President's proposed budget. Budget authority imposes a ceiling on obligations and outlays; obligations and outlays flow from budget authority.

- **Budget authority** is the primary source of legal authorization to enter into obligations that will result in outlays. Budget authority is most commonly granted in the form of appropriations by the congressional committees assigned to determine the budget for each function.

- **Obligations** represent the amounts for orders placed, contracts awarded, services received, and similar transactions during a given period, regardless of when the funds were appropriated and when the future payment of money is required.

- **Outlays** represent the amounts for checks issued and cash payments made during a given period, regardless of when the funds were appropriated or obligated.

Budget Functions

All activities covered by the Federal budget, including R&D, are classified into 20 broad functional categories. The Federal budget total comprises funding for these 20 functions. An agency's activities are not necessarily included in only one function. Instead, the programs of one agency typically are distributed across functions, and each function often includes programs from multiple agencies. No overlap occurs between functions or between the various agency programs within those functions. In a few cases components of a major national effort are funded through multiple functions, such as the Human Genome mapping effort (health and energy).

Notably, each specific R&D activity is assigned to only one function area, consistent with the official codes used in budget documents, even though the R&D activity may address several functional concerns. For example, except for those of the Army Corps of Engineers, all R&D activities sponsored by the Department of Defense (DoD) are classified as defense, even though some activities have secondary objectives such as space or health. Moreover, only R&D funded by the Department of Health and Human Services and the Department of Labor is classified in the health function category. Yet some R&D funding, from at least three additional agencies—DoD and the Departments of Energy and Veterans Affairs–has a major health component.

The functional categories and definitions used in this report are the same as those used in the Federal budget, with one exception. R&D activities categorized as general science, space, and technology (function 250) are reported separately here. Subfunction 251 contains R&D activities for general science and basic research, and subfunction 252 contains R&D activities for space research and technology. Not all federally sponsored basic research is categorized in function 251, however; some basic research is included in the remaining 19 functional categories.

Five Federal budget functions—medicare (function 570), social security (function 650), net interest (function 900), allowances (function 920), and undistributed offsetting receipts (function 950)—have no R&D components. Consequently, they are not discussed in this report, except where R&D is described as a proportion of total Federal budget authority.

The Agency/Function Crosswalk on page 4 lists—by name and function code—the 16 individual R&D functions funded by agencies.

Data Sources

Within the overall Federal Budget there is no separately identified R&D budget as such; nor are most appropriations for R&D so labeled except in the case of certain program areas, such as in defense, energy, health, and environment. Consequently, most funds for R&D are not line items in an agency's budget submission but are included within general program funding. To determine funding for Federal R&D, the Office of Management and Budget (OMB) requires agencies whose annual R&D funding is greater than $10 million to submit data on their R&D programs as part of their annual budget submissions. Specifically, the agencies provide data—reported, in accordance with OMB Circular A-11, Max Schedule C, "Research and Development Activities"—on funding levels for basic research, applied research, development, R&D facilities, and R&D support to universities and colleges.

The data in this report represent agencies' best estimates of actual and proposed Federal funding for R&D collected during the period February 2 through April 30,

1998. These data are based primarily on information provided to OMB by 23 agencies and account for more than 99 percent of all federally sponsored R&D activities. Also incorporated in this report is R&D information that became available from the individual agencies after the administration's budget was prepared and reported in the *Budget of the United States Government*. Such information consists of agency budget justification documents submitted to Congress and supplemental-program-specific information obtained from agency budget and program staff through mid-May 1998. Therefore, budget numbers for individual activities, programs, or agencies may differ slightly from those published in the President's budget or agency budget documents.

AGENCY/FUNCTION CROSSWALK

AGENCIES	National Defense (050)	Health (550)	Space Research and Technology (252)	General Science (251)	Energy (270)	Transportation (400)	Natural Resources and Environment (300)	Agriculture (350)	Education, Training, Employment, and Social Services (500)	Veterans Benefits and Services (700)	International Affairs(150)	Commerce and Housing Credit (370)	Community and Regional Development (450)	Administration of Justice (750)	Income Security (600)	General Government (800)
	FUNCTIONS															
Agency for International Development											●					
Corps of Engineers (Civil)							●									
Dept. of Agriculture							●	●								
Dept. of Commerce							●					●	●			
Dept. of Defense (Military)	●															
Dept. of Education									●							
Dept. of Energy	●			●	●											
Dept. of Health and Human Services		●							●							
Dept. of Housing and Urban Development													●			
Dept. of Justice														●		
Dept. of Labor		●							●						●	
Dept. of the Interior							●									
Dept. of the Treasury														●		●
Dept. of Transportation						●										
Dept. of Veterans Affairs										●						
Environmental Protection Agency							●									
National Aeronautics and Space Adm.			●			●										
National Science Foundation				●												
Nuclear Regulatory Commission					●											
Smithsonian Institution									●							
Social Security Administration															●	
Tennessee Valley Authority					●								●			

SOURCE: Agencies' submissions to Office of Management and Budget Circular No. A-11, Max Schedule C, "Research and Development Activities"; agency budget justification documents; and supplemental data obtained from the agencies' budget offices.

RESEARCH AND DEVELOPMENT IN THE 1999 BUDGET: AN OVERVIEW

INTRODUCTION

This report presents information on Federal proposed fiscal year (FY) 1999 budget authority for the research and development (R&D) components of agency programs. The data were submitted by Federal agencies to the Office of Management and Budget in early 1998. This report documents historical data not affected by current legislation and therefore can be used for tracking funding trends. The report also provides detailed data on Federal R&D authorizations not readily available from other sources.

TOTAL R&D

In the first half of 1998, the administration proposed total budget authority of $75 billion for FY 1999 for all Federal R&D programs, an increase of 2 percent from the estimated 1998 R&D total of $74 billion (table 1). After adjusting for expected inflation, proposed R&D budget authority will stay the same as the FY 1998 level. Budget authority for R&D grew 3 percent between FY 1997 and FY 1998 (an increase of 1 percent in constant dollars).

The largest 1999 R&D increase ($1 billion) is slated for health (budget function code 550), which mostly includes health programs of the National Institutes of Health (NIH).

Among individual functions, the largest FY 1999 R&D decrease ($0.2 billion) is slated for space research and technology (budget function code 252), which includes space programs of the National Aeronautics and Space Administration (NASA).

The administration proposed more than half (53 percent) of its FY 1999 R&D budget authority for defense (budget function code 050), which includes military programs of the Department of Defense (DoD) and the atomic energy defense activities of the Department of Energy (DOE). Proposed defense-related R&D funding is $39.7 billion in FY 1999, a slight decrease from the preliminary 1998 level of $39.9 billion. This proposed decrease reverses the rise of nearly 1 percent in budget authority for defense-related R&D between FYs 1997–98. However, R&D funding within the national defense function has continued to decrease in real terms since 1993 (with the exception of a 2.5-percent increase between FYs 1996–97). The proportion of R&D funds proposed for defense-related activities has declined from 59 percent in FY 1993 to 53 percent in FY 1999.

The proposed real decrease in defense-related R&D budget authority is offset by an increase in proposed funding of civilian R&D in FY 1999. Nondefense R&D funding is anticipated to grow by about 5 percent to $35.5 billion in FY 1999 (3 percent in constant dollars). Civilian-related activities represent 47 percent of Federal funding for the conduct of R&D.

The five largest budget functions with respect to R&D expenditures—national defense, health, space research and technology, general science, and natural resources and environment—together account for 92 percent of all proposed Federal R&D funding. The health and general science functions are expected to receive increased funding for R&D in FY 1999. Highlights of proposed R&D funding by function in the FY 1999 budget follow.

- National defense R&D funding (function 050) is expected to drop by $0.2 billion (down 0.4 percent) below the FY 1998 level. Army would experience a decrease in funding, losing 5 percent (a drop of $0.2 billion) of its research, development, test, and evaluation (RDT&E) funds. Air Force RDT&E would decline 3 percent, from $14 billion in FY 1998 to $13.6 billion in FY 1999. Among the defense agencies, the Ballistic Missile Defense Organization (BMDO) funding is expected to decline 3 percent between FYs 1998–99. However, the Defense Advanced Research Projects Agency (DARPA) expects to stay at its FY 1998 level. Only one of DOE's defense-related R&D programs will gain funding over its FY 1998 level—weapons activities, up 19.5 percent. Weapons activities includes funding from the stockpile stewardship and stockpile management accounts. DOE plans to decrease funding for naval reactors development by 1 percent, to $0.6 billion. Its environmental restoration and waste management programs are to decrease by 37 percent, to $0.1 billion in FY 1999. DOE's other defense-related R&D programs are expected to get nearly the same funding as in FY 1998.

- The administration proposes an 8-percent increase ($1 billion) in health-related R&D (function 550) to $15 billion in FY 1999. Most of this proposed growth is for the basic and applied biomedical and behavioral research programs of NIH, which will account for 95 percent of all Federal health R&D. R&D programs for all except one component of NIH will receive greater support in FY 1999 than in FY 1998.

  Funding for NIH's Office of the Director is expected to fall 17 percent. The Office of the Director provides support to the Women's Health Initiative and other research activities. More than $2 billion is proposed for R&D projects at the National Cancer Institute. Also, $1.7 billion is proposed for R&D on AIDS/HIV within the Office of AIDS Research, and $1.6 billion is slated for R&D programs at the National Heart, Lung, and Blood Institute. The National Institute of Diabetes and Digestive and Kidney Diseases expects to receive a 7-percent increase (up $62 million) over FY 1998. The National Institute of Neurological Disorders and Stroke expects an 8-percent increase (up $58 million) over FY 1998.

Table 1. Federal R&D budget authority, by budget function: fiscal years 1997-99

1999 rank	Budget function	1997 actual	1998 preliminary	1999 proposed	Percent change 1997-98	Percent change 1998-99
		[In millions of dollars]				
	Total	71,653	73,639	75,229	2.8	2.2
1	National defense	39,591	39,871	39,699	0.7	-0.4
2	Health	12,670	13,557	14,622	7.0	7.9
3	Space research and technology	7,844	8,265	8,037	5.4	-2.8
4	General science 1/	2,944	4,210	4,649	43.0	10.4
5	Natural resources and environment	1,886	2,015	2,013	6.8	-0.1
6	Transportation	1,785	1,920	1,904	7.5	-0.8
7	Energy 1/	2,372	1,143	1,470	-51.8	28.6
8	Agriculture	1,203	1,243	1,272	3.3	2.3
9	Commerce and housing credit	409	385	465	-5.7	20.7
10	Education, training, employment, and social services	373	437	454	17.2	3.9
11	Veterans benefits and services	267	276	304	3.4	10.1
12	International affairs	190	171	175	-10.0	2.3
13	Administration of justice	59	76	71	28.8	-6.6
14	Community and regional development	48	49	62	2.1	26.5
15	Income security	9	19	30	111.1	57.9
16	General government	2	2	2	0.0	0.0

1/ Beginning in FY 1998, a number of DOE programs were reclassified from energy (270) to general science (251).

KEY: NA = Not applicable

NOTES: Because of rounding, components may not add to the totals shown. Percentage change is derived from unrounded data.

SOURCE: Agencies' submissions to Office of Management and Budget, MAX Schedule C; agency budget justification documents; and supplemental data obtained from the agencies' budget offices.

- R&D budget authority for space research and technology activities (subfunction 252) of NASA is expected to decrease nearly 3 percent below the FY 1998 funding level. It will decrease by $0.2 billion, to $8 billion. NASA expects to fund its largest program, space station research, at 2 percent below the FY 1998 level. NASA also plans to decrease R&D funding for its space transportation technology program (down 4 percent) and for its mission communication services (down 6.5 percent to $0.4 billion). The space science program, NASA's second largest R&D account, is expected to receive $2.3 billion, up 1 percent from FY l998. Decreases are scheduled for R&D activities for earth science (formerly the Mission to Planet Earth program) which will receive a decrease of $41 million (down 3 percent), to $1.5 billion in FY 1999. The administration also proposes that NASA receive increases for life and microgravity sciences, increasing $23 million from the FY 1998 level.

- Research funding for general science (subfunction 251) in FY 1998 is 43 percent above (an increase of more than $1 billion) the FY 1997 level because a number of DOE programs were reclassified from energy R&D (function 270) to general science R&D. However, research funding for general science is expected to increase by 10 percent, or $0.4 billion in FY 1999, to nearly $5 billion. It would account for 6 percent of the total Federal R&D budget authority. Had DOE not changed its appropriation account structure, general science research funding would have increased by $380 million in FY 1999, up 12 percent from a smaller FY 1998 base. Almost 60 percent of the general science dollars are slated for the National Science Foundation (NSF); the remaining funds are for DOE general science programs. All NSF programs are expected to gain funding, ranging from 6–20 percent over their FY 1998 levels. NSF expects to increase research funding for mathematical and physical sciences (NSF's largest research program) by $76 million or 11 percent above the FY 1998 level. Also, NSF proposes to direct $50 million more toward geosciences research (NSF's second largest research program), up 12 percent.

  DOE's research budget is expected to grow 8 percent with increases in nuclear physics (up $51 million or 22 percent above the FY 1998 level), basic energy sciences (up $45 million or 7 percent), high energy physics programs (up $31 million or 6 percent), and computational and technology research (up $11 million or 8 percent).

- Natural resources and the environment R&D funding (function 300) is expected to stay at the FY 1998 level of $2 billion in FY 1999. It will comprise nearly 3 percent of the total Federal R&D budget authority. Within this functional category, the largest share ($0.6 billion, comprising 32 percent of the R&D funding for natural resources and the environment) is proposed for the Environmental Protection Agency's (EPA's) pollution control and abatement efforts. Nearly all of EPA's R&D funding for pollution control and abatement is for EPA's science and technology activities, which include budget authority for R&D transferred from EPA's Superfund account.

  The National Oceanic and Atmospheric Administration (NOAA) plans to decrease its natural resources initiatives by 5 percent from $543 million in FY 1998 to $518 million in FY 1999. NOAA's natural resources initiatives include NOAA's oceanic and atmospheric research programs and initiatives.

- Transportation R&D funding (function 400) is expected to decrease by 1 percent to $1.9 billion in FY 1999. Transportation R&D will comprise 2.5 percent of total Federal R&D budget authority. Three-fourths of the transportation R&D funding is slated for air transportation research mostly by NASA for aeronautical research and technology. Funding for ground transportation (supported entirely by the Department of Transportation) will account for 21 percent of the total transportation R&D.

- A 29-percent increase (up $0.3 billion) is proposed for energy R&D (function 270) to $1.5 billion in FY 1999, even with several programs in energy supply being reclassified in FY 1998 to the general science function. Energy R&D will comprise 2 percent of total Federal R&D budget authority. The increase in energy funding is due largely to more support for the fossil energy programs (specifically for the petroleum, coal, and gas program) and for the energy supply activities. DOE expects to cancel $40 million in unspent, previously appropriated funds for its clean coal technology program under the fossil energy account in FY 1999. However, the increase in funding for DOE's energy supply programs is attributable to greater support for the solar and renewable energy account, an increase of $88 million, and nuclear energy programs, an increase of $69 million. The Tennessee Valley Authority is expected to get $2 million less than its FY 1998 funding level, an 8-percent decrease. The Nuclear Regulatory Commission expects to receive $8 million less than it did in FY 1998, down 13 percent.

- Funding for agricultural R&D (function 350) is expected to increase in FY 1999 by 2 percent to $1.3 billion, and would account for under 2 percent of the total Federal R&D budget authority. Nearly 60 percent of the Department of Agriculture's (USDA's) R&D funding is for the Agricultural Research Service (ARS), an intramural research agency with primary responsibility for providing initiative and leadership in agricultural research. Several initiatives, including the research on plant sciences, commodity conversion and delivery, and animal sciences, are funded by ARS. The ARS has 101 research locations throughout the United States and abroad. Another USDA program, the National Research Initiative (NRI), is expected to increase 34 percent to $130 million in FY 1999. NRI programs support research on integrated pest management, biological control of pests and diseases, human nutrition, plant genome, water quality, food safety, sustainable agriculture, and agricultural systems.

- The remaining eight functions each have less than $0.5 billion in proposed FY 1999 R&D budget authority. However, overall R&D for these functions is expected to increase by more than 10 percent ($148 million) to $1.6 billion. The main areas of this growth are in commerce and housing credit (up $80 million); veterans benefits and services (up $28 million); and education, training, employment, and social services (up $17 million).

  – R&D funding for commerce and housing credit (function 370) is expected to increase by 21 percent ($80 million) to nearly $0.5 billion. This total reflects increased support for the Advanced Technology Program (ATP) funded at the National Institute of Standards and Technology (NIST). NIST expects to increase ATP funding by 40 percent, $68 million above the FY 1998 level. ATP funds precompetitive R&D on commercial technologies on a cost-shared basis through a competitive process. Funding for research and general education programs (subfunctions 501-3) of the Department of Education and Smithsonian Institution is expected to increase by 23 percent ($58 million) to $312 million.

  – The administration proposes to increase funds for international affairs (function 150) by 2 percent, to $175 million in FY 1999. This increase is due mainly to additional funding of the global programs in the Agency for International Development (AID). AID supports programs in four areas: population and health, broad-based economic growth, environment, and democracy.

  – Funding for administration of justice (function 750) of the Departments of Justice and Treasury is expected to decrease by 7 percent to $71 million in FY 1999. This decrease is due mainly to an 8-percent drop in R&D funding at the Office of Justice Programs (OJP) in the Department of Justice. OJP provides Federal leadership, coordination, and assistance needed to make the Nation's justice system more efficient and effective in preventing and controlling crime.

  – A 10-percent increase (to $300 million) is slated for veterans benefits and services (function 700), due to increased funding of the medical and prosthetic research programs in the Department of Veterans Affairs. R&D funding is also expected to increase 26.5 percent (to $62 million) in community and regional development (function 450) because of the Department of Housing and Urban Development's increased R&D funding. Funding for income security (function 600) is expected to increase 60 percent to $30 million in FY 1999. R&D funding is expected to stay at the FY 1998 level for general government (800), which includes $2 million for engraving and printing activities supported by the Department of Treasury.

Distribution of Total R&D Budget Authority Among Functions

The five largest R&D functions in FY 1999—defense, health, space research and technology, general science, and natural resources and the environment—account for 92 percent of all proposed Federal R&D budget authority. Transportation, energy, and agriculture each account for between 1 and 3 percent of Federal funding of R&D. The remaining eight functions each account for less than 1 percent of the total 1999 proposed R&D budget authority (table 2).

During the early and mid-1980s, practically all growth in Federal R&D support was defense-related (figure 1). Since FY 1986, however, defense R&D has dropped significantly from its peak 69-percent share of the Federal total to the proposed 53-percent share for 1999 (table 3). Despite this decline, defense is expected to receive more

than two and one half times the budget authority for R&D than the next largest function, health.

Proportions of only four functions of the total R&D budget authority are expected to be notably larger in 1999 than in 1998—health (18.4 percent of the total R&D budget authority in FY 1998 and 19.4 percent of the total R&D budget authority in FY 1999); general science (5.7 percent in FY 1998 and 6.2 percent in FY 1999); energy (1.6 percent in FY 1998 and 2.0 percent in FY 1999); and commerce and housing credit (0.5 percent in FY 1998 and 0.6 percent in FY 1999). Proportions for natural resources and the environment; agriculture; education, training, employment, and social services; international affairs; veterans benefits and services; community and regional development; administration of justice; income security; and general government are expected to stay approximately the same as in 1998. Based on the administration's budget proposal, proportions of three functions would drop notably in FY 1999—defense (54.1 percent of the total budget authority in FY 1998 and 52.8 percent of total budget authority in FY 1999), space research and technology (11.2 percent in FY 1998 and 10.7 percent in FY 1999), and transportation (2.6 percent in FY 1998 and 2.5 percent in FY 1999).

BASIC RESEARCH

The administration proposes to increase budget authority for basic research by 7.7 percent in FY 1999 to $17 billion (table 4). When adjusted for expected inflation, this would be about a 6-percent increase from the estimated FY 1998 level. The basic research share of total R&D budget authority has slowly increased from 15 percent in FY 1986 to the proposed 22 percent in FY 1999 (figure 2).

Table 2. Distribution of total Federal R&D budget authority, by function: fiscal years 1997-99

[In percentages]

1999 rank	Budget function	1997 actual	1998 preliminary	1999 proposed
	Total	100.0	100.0	100.0
1	National defense	55.3	54.1	52.8
2	Health	17.7	18.4	19.4
3	Space research and technology	10.9	11.2	10.7
4	General science 1/	4.1	5.7	6.2
5	Natural resources and environment	2.6	2.7	2.7
6	Transportation	2.5	2.6	2.5
7	Energy 1/	3.3	1.6	2.0
8	Agriculture	1.7	1.7	1.7
9	Commerce and housing credit	0.6	0.5	0.6
10	Education, training, employment, and social services	0.5	0.6	0.6
11	Veterans benefits and services	0.4	0.4	0.4
12	International affairs	0.3	0.2	0.2
13	Administration of justice	0.1	0.1	0.1
14	Community and regional development	0.1	0.1	0.1
15	Income security	2/	2/	2/
16	General government	2/	2/	2/

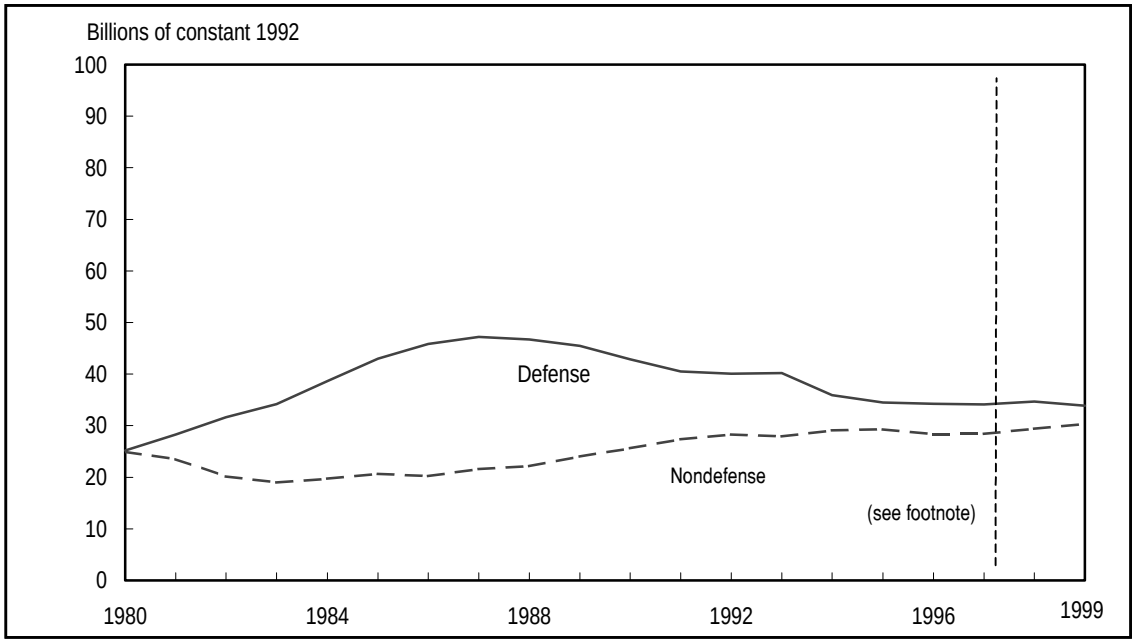
1/ Beginning in FY 1998, a number of DOE programs were reclassified from energy (270) to general science

2/ Less than one-tenth of one percent.

NOTE: Because of rounding, components may not add to totals.

SOURCE: Agencies' submissions to Office of Management and Budget, MAX Schedule C; agency budget justification documents; and supplemental data obtained from the agencies' budget offi

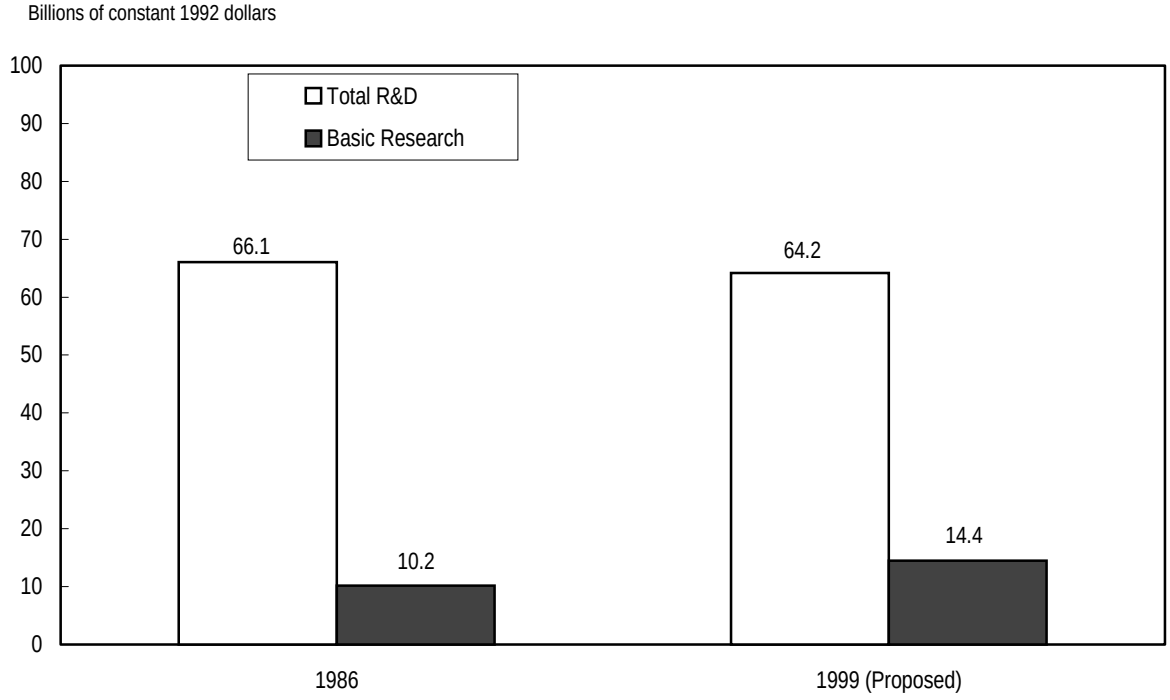
Figure 1. Federal budget authority for defense and nondefense R&D: fiscal years 1980-99[1]



[1]1998 numbers are preliminary; 1999 numbers are proposed.

SOURCE: Agencies' submissions to the Office of Management and Budget, Circular No. A-11, Max Schedule C, "Research and Development Activities;" agency budget justification document; and supplemental data obtained from the agencies' budget offices.

Figure 2. Federal budget authority for basic research compared with total R&D budget authority: fiscal years 1986 and 1999



SOURCE: Agencies' submissions to the Office of Management and Budget, Circular No. A-11, Max Schedule C, "Research and Development Activities;" agency budget justification documents; and supplemental data obtained from the agencies' budget offices.

Table 3. Federally funded R&D for national defense and civilian functions: fiscal years 1955-99

Fiscal Year	Current dollars			Constant 1992 dollars 1/			Percent of total	
	Total	National defense	Civilian functions	Total	National defense	Civilian functions	National defense	Civilian functions
	[In millions of dollars]							
1955	2,533	2,151	382	12,266	10,416	1,850	84.9	15.1
1956	2,988	2,535	453	14,081	11,946	2,135	84.8	15.2
1957	3,932	3,327	605	17,865	15,116	2,749	84.6	15.4
1958	4,570	3,801	769	20,239	16,833	3,406	83.2	16.8
1959	6,694	5,556	1,138	29,079	24,136	4,944	83.0	17.0
1960	7,552	6,107	1,445	32,510	26,289	6,220	80.9	19.1
1961	9,059	7,005	2,054	38,434	29,720	8,714	77.3	22.7
1962	10,290	7,238	3,052	43,163	30,361	12,802	70.3	29.7
1963	12,495	7,764	4,731	51,803	32,189	19,614	62.1	37.9
1964	14,225	7,829	6,396	58,180	32,020	26,160	55.0	45.0
1965	14,614	7,342	7,272	58,785	29,533	29,252	50.2	49.8
1966	15,320	7,536	7,784	60,244	29,634	30,610	49.2	50.8
1967	16,529	8,566	7,963	63,016	32,657	30,358	51.8	48.2
1968	15,921	8,275	7,646	58,469	30,389	28,079	52.0	48.0
1969	15,641	8,356	7,285	55,016	29,391	25,624	53.4	46.6
1970	15,339	7,981	7,358	51,250	26,666	24,584	52.0	48.0
1971	15,543	8,110	7,433	49,390	25,771	23,619	52.2	47.8
1972	16,496	8,902	7,594	50,033	27,000	23,033	54.0	46.0
1973	16,800	9,002	7,798	48,809	26,153	22,655	53.6	46.4
1974	17,410	9,016	8,394	47,169	24,427	22,742	51.8	48.2
1975	19,039	9,679	9,360	46,767	23,775	22,992	50.8	49.2
1976	20,780	10,430	10,350	47,606	23,895	23,711	50.2	49.8
1977	23,450	11,864	11,586	49,925	25,259	24,667	50.6	49.4
1978	25,976	12,899	13,077	51,663	25,654	26,008	49.7	50.3
1979	28,208	13,791	14,417	51,815	25,332	26,482	48.9	51.1
1980	29,739	14,946	14,793	50,167	25,213	24,954	50.3	49.7
1981	33,735	18,413	15,322	51,804	28,275	23,529	54.6	45.4
1982	36,115	22,070	14,045	51,800	31,655	20,145	61.1	38.9
1983	38,768	24,936	13,832	53,151	34,187	18,964	64.3	35.7
1984	44,214	29,287	14,927	58,361	38,658	19,703	66.2	33.8
1985	49,887	33,698	16,189	63,656	42,999	20,657	67.5	32.5
1986	53,249	36,926	16,323	66,066	45,814	20,252	69.3	30.7
1987	57,069	39,152	17,917	68,816	47,211	21,605	68.6	31.4
1988	59,106	40,099	19,007	68,880	46,730	22,150	67.8	32.2
1989	62,115	40,665	21,450	69,449	45,466	23,983	65.5	34.5
1990	63,781	39,925	23,856	68,471	42,861	25,610	62.6	37.4
1991	65,898	39,328	26,570	67,831	40,482	27,349	59.7	40.3
1992	68,398	40,083	28,315	68,398	40,083	28,315	58.6	41.4
1993	69,884	41,249	28,635	68,087	40,188	27,898	59.0	41.0
1994	68,331	37,764	30,566	65,003	35,925	29,078	55.3	44.7
1995	68,791	37,204	31,587	63,802	34,505	29,296	54.1	45.9
1996	69,049	37,801	31,248	62,596	34,268	28,327	54.7	45.3
1997	71,653	39,591	32,062	63,556	35,117	28,439	55.3	44.7
1998	73,639	39,871	33,768	64,101	34,707	29,394	54.1	45.9
1999	75,229	39,699	35,530	64,199	33,879	30,321	52.8	47.2

1/ Calculated using fiscal year GDP implicit price deflators with 1992 as the base year.

NOTES: The national defense function includes Department of Defense's military activities and Department of Energy's atomic energy defense programs. Civilian functions include all other federally funded R&D activities. Data for 1955-77 are obligations. Data for 1978-97 are actual budget authority. Data for 1998 are preliminary estimates of budget authority. Data for 1999 are budget authority proposed by the administration.

SOURCE: Agencies' submissions to Office of Management and Budget, MAX Schedule C; agency budget justification documents; and supplemental data obta from the agencies' budget offices.

Table 4. Federal budget authority for basic research, by budget function: fiscal years 1997-99

1999 rank	Budget function	1997 actual	1998 preliminary	1999 proposed	Percent change	
					1997-98	1998-99
		[In millions of dollars]				
	Total	14,961	15,710	16,917	5.0	7.7
4	National defense	1,090	1,099	1,155	0.8	5.0
1	Health	6,852	7,361	7,978	7.4	8.4
3	Space research and technology	1,653	1,658	1,697	0.3	2.3
2	General science 1/	2,753	3,944	4,367	43.3	10.7
7	Energy 1/	1,288	257	269	-80.1	4.8
6	Transportation	420	459	468	9.4	2.0
8	Natural resources and environment	153	156	164	2.3	5.0
5	Agriculture	548	560	589	2.2	5.3
10	Commerce and housing credit	34	34	37	0.2	9.1
9	Education, training, employment, and social services	142	148	157	4.2	6.1
13	International affairs	2	1	1	-50.0	0.0
12	Veterans benefits and services	14	14	15	0.0	7.1
14	Community and regional development	0	0	0	NA	NA
11	Administration of justice	13	19	20	46.2	5.3
15	Income security	0	0	0	NA	NA
16	General government	0	0	0	NA	NA

1/ Beginning in FY 1998, a number of DOE programs were reclassified from energy (270) to general science (251).

KEY: NA = Not applicable

NOTES: Because of rounding, components may not add to the totals shown. Percentage change is derived from unrounded data.

SOURCE: Agencies' submissions to Office of Management and Budget, MAX Schedule C; agency budget justification documents; and supplemental data obtained from the agencies' budget offices.

Four of the five largest R&D functions—defense, health, space research and technology, and general science—are also the largest basic research functions; they account for 90 percent of the basic research total (figure 3). Health ($8 billion) accounts for the largest share (47 percent) of the requested FY 1999 basic research total, followed by general science ($4 billion) and space research and technology ($1.7 billion). Defense accounts for $1.2 billion—or nearly 7 percent—of the proposed basic research total, but only 3 percent of the defense R&D total is basic research. (The basic research portion of the defense R&D total has remained at about 3 percent for the last eight years.) Of the nondefense R&D total, 44 percent is basic research.

R&D's Share of Total Budget Authority

R&D funding as a percentage of the total funding for functions in which R&D is conducted remains at about 8 percent (table 5). Since FY 1990, the percentage has fluctuated narrowly from a low of 7.6 percent in FY 1991 to a high of 8.2 percent in FY 1996. For functions that include R&D activities, only three (energy, general science, and space research and technology) are expected to be more than 60 percent of each function's total budget authority. (Energy R&D is greater than total energy budget authority because gross budget authority (spending) has been reduced by offsetting receipts, resulting in total net budget authority (spending minus receipts) that is less than R&D budget authority.) The R&D shares in the other functions range from a high of 15 percent for national defense to less than 0.1 percent for income security and general government.

Only five functions (health, energy, natural resources and environment, veterans benefits and services, and commerce and housing credit) will show an increased share of their budget authority directed toward R&D in FY 1999. The R&D shares of four functions (defense, space research and technology, transportation, and agriculture) are expected to drop; the remaining functions' R&D shares will each stay at the FY 1998 levels.

Table 5. Federal R&D budget authority as a percentage of each function's total budget authority: fiscal years 1997-99

1999 rank	Budget function	1997 actual	1998 preliminary	1999 proposed
	All functions conducting R&D	8.0	8.1	8.0
4	National defense	14.6	14.9	14.7
6	Health	9.7	10.0	10.5
3	Space research and technology	63.0	67.1	65.5
2	General science 1/	69.7	74.6	74.6
1	Energy 1/ 2/	139.1	-297.6	306.2
9	Transportation	4.3	4.5	4.4
7	Natural resources and environment	8.2	8.3	8.5
5	Agriculture	10.5	11.7	11.3
8	Commerce and housing credit	5.1	3.0	6.2
12	Education, training, employment, and social services	0.6	0.7	0.7
10	International affairs	1.3	1.0	1.0
11	Veterans benefits and services	0.7	0.6	0.7
13	Community & regional development	0.4	0.6	0.6
14	Administration of justice	0.2	0.3	0.3
15	Income security	3/	3/	3/
16	General government	3/	3/	3/

1/ Beginning in FY 1998, a number of DOE programs were reclassified from energy (270) to general science (251).

2/ R&D as percentage of total budget authority is greater than 100 percent because gross budget authority has been reduced by offsetting receipts, for total (net) budget authority that is less than R&D budget authority. In FY 1998, offsetting receipts exceeded gross budget authority.

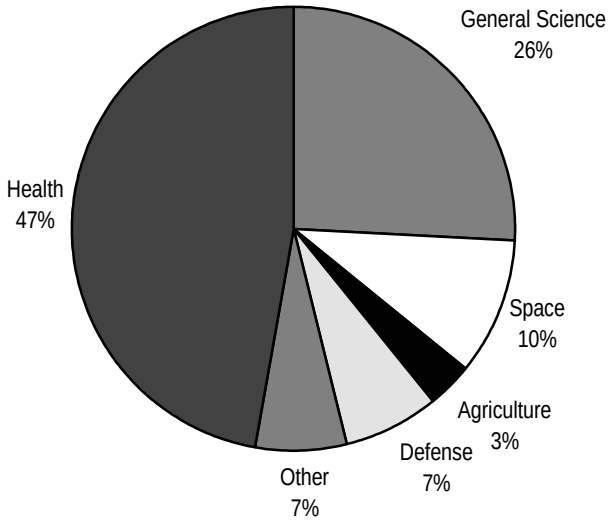
3/ Less than one-tenth of 1 percent

NOTE: Total budget authority includes discretionary and mandatory budget authority, less offsets.

SOURCE: Agencies' submissions to Office of Management and Budget MAX Schedule C; agency budget justification documents; supplemental data obtained from the agencies' budget offices; Offices of Office of Management and Budget, *Budget of the United States Government, Fiscal Year 1999* , Washington, DC: February, 1998 (Table 33-1).

Figure 3. Proposed Federal budget authority for basic research by budget function: fiscal year 1999

(In percentages)



SOURCE: Agencies' submissions to the Office of Management and Budget, Circular No. A-11, Max Schedule C, "Research and Development Activities;" agency budget justification documents; and supplemental data obtained from the agencies' budget offices.

R&D BY SPECIFIC BUDGET FUNCTION TABLES

Table 6. Federal R&D budget authority for national defense (050): fiscal years 1997-99

Agency	1997 actual	1998 preliminary	1999 proposed	Percent change 1998-99
	[In millions of dollars]			
Total	39,591	39,871	39,699	-0.4
Department of Defense--military (051)	37,116	37,295	36,891	-1.1
Research, development, test, and evaluation (RDT&E)	36,404	36,600	36,079	-1.4
Department of the Army	4,898	5,019	4,781	-4.7
Department of the Navy	7,917	7,840	8,109	3.4
Department of the Air Force	14,017	14,031	13,598	-3.1
Defense agencies	9,279	9,434	9,315	-1.3
Ballistic Missile Defense Organization	3,360	3,282	3,179	-3.1
Defense Advanced Res. Projects Agency	2,070	2,041	2,040	-0.1
Other defense agencies	3,849	4,111	4,096	-0.4
Developmental test and evaluation	269	246	251	2.0
Operational test and evaluation	24	30	25	-16.7
Other military funding 1/	712	695	812	16.8
Department of Energy--atomic energy defense activities (053)	2,475	2,576	2,808	9.0
Weapons Activities 2/	1,429	1,556	1,860	19.5
Naval reactors development	619	606	602	-0.7
Environmental restoration andwaste management	198	180	113	-37.3
Special Technologies	4	4	4	0.0
Nonproliferation	204	206	206	0.0
Nuclear safeguards and security	22	23	23	0.0

1/ Adjustment to R&D budget to exclude major construction and add appropriate personnel costs in direct support of conduct of R&D, and other appropriations.

2/ Includes funding from Stockpile Stewardship and Stockpile Management accounts.

NOTES: Because of rounding, components may not add to totals. Percentage change derived from unrounded data.

SOURCE: Departments of Defense (DoD) and Energy (DOE) submissions to Office of Management and Budget, MAX Schedule C; DoD's "RDT&E Programs (R-1)"; Budget of the United States Government; and supplemental data obtained from the DOE budget office.

Table 7. Total obligational authority (TOA) for Department of Defense (DOD) research, development, test, and evaluation (RDT&E) budget: fiscal years 1997-99

Funding category and agency	1997 actual	1998 preliminary	1999 proposed	Percent change 1998-99
	[In millions of dollars]			
Total RDT&E (budget authority)	36,404	36,600	36,079	-1.4
Total RDT&E (TOA)	36,503	36,659	36,079	-1.6
Basic research	1,032	1,042	1,111	6.7
Department of the Army	175	181	201	11.1
Department of the Navy	346	339	363	7.1
Department of the Air Force	182	196	209	6.7
Defense agencies	329	326	338	3.7
Applied research	2,822	2,996	3,020	0.8
Department of the Army	542	654	511	-21.8
Department of the Navy	514	494	525	6.3
Department of the Air Force	635	568	582	2.5
Defense agencies	1,130	1,281	1,402	9.5
Advanced technology development	3,639	3,762	3,050	-18.9
Department of the Army	654	658	484	-26.5
Department of the Navy	462	515	461	-10.5
Department of the Air Force	453	426	379	-10.9
Defense agencies	2,071	2,164	1,727	-20.2
Demonstration and validation	5,864	6,397	6,516	1.9
Department of the Army	540	563	466	-17.2
Department of the Navy	1,904	2,219	2,358	6.3
Department of the Air Force	835	1,069	1,283	20.0
Defense agencies	2,585	2,546	2,409	-5.4
Engineering and manufacturing development	8,536	8,199	7,987	-2.6
Department of the Army	1,146	1,162	1,269	9.2
Department of the Navy	2,154	2,227	2,063	-7.4
Department of the Air Force	4,521	4,153	3,751	-9.7
Defense agencies	716	657	903	37.5

See explanatory information and SOURCE at end of table.

Table 7. Total obligational authority (TOA) for Department of Defense (DoD) research, development, test, and evaluation (RDT&E) budget: fiscal years 1997-99

Funding category and agency	1997 actual	1998 preliminary	1999 proposed	Percent change 1998-99
	[In millions of dollars]			
Management support	3,465	3,199	2,771	-13.4
Department of the Army	1,145	1,129	1,077	-4.6
Department of the Navy	681	551	617	12.0
Department of the Air Force	1,053	1,019	554	-45.6
Defense agencies	286	224	246	10.0
Developmental test & evaluation	276	246	251	2.2
Operational test & evaluation	24	30	25	-15.3
Operational systems development	11,145	11,064	11,624	5.1
Department of the Army	716	679	773	13.9
Department of the Navy	1,823	1,535	1,722	12.2
Department of the Air Force	6,411	6,551	6,839	4.4
Defense agencies	2,195	2,299	2,289	-0.4
Adjustment for RDT&E budget authority 1/	-99	-59	0	NA

1/ Detailed budget information on DoD's RDT&E activities is available only in total obligational authority (TOA), which is the sum of new budget authority, unobligated budget authority from previous years, and other authorized credits. Adjustment converts TOA to budget authority by subtracting unobligated budget authority from previous years and other authorized credits from TOA.

KEY: NA = Not applicable

NOTES: Because of rounding, components may not add to totals. Percentage change derived from unrounded data.

SOURCE: Data from DoD, "RDT&E Programs (R-1)." Total RDT&E budget authority data from "Budget of the United States Government FY 1999," Appendix pp. 271-277.

Table 8. Federal R&D budget authority for health (550): fiscal years 1997-99

Agency	1997 actual	1998 preliminary	1999 proposed	Percent change 1998-99
	[In millions of dollars]			
Total	12,670	13,557	14,622	7.9
Health care services and health research and training (551, 552)	12,508	13,395	14,471	8.0
Department of Health and Human Services (DHHS):				
National Institutes of Health	11,994	12,867	13,915	8.1
Centers for Disease Control	323	358	365	2.0
Agency for Health Care Policy and Research	97	90	101	12.2
Health Care Financing Administration	44	50	50	0.0
Health Resources and Services Administration	14	14	24	71.4
Departmental Management	36	16	16	0.0
Consumer and occupational health and safety (554)	162	162	151	-6.8
Food and Drug Administration (DHHS)	157	157	146	-7.0
Occupational Safety and Health Administration (Dept. of Labor)	5	5	5	0.0

KEY: NA = Not applicable

NOTES: Because of rounding, components may not add to totals. Percentage change derived from unrounded data.

SOURCE: Agencies' submissions to Office of Management and Budget, MAX Schedule C; and supplemental data obtained from the agencies' budget offices.

Table 9. Federal R&D budget authority for the National Institutes of Health (NIH): fiscal years 1997-99

Agency	1997 actual	1998 preliminary	1999 proposed	Percent change 1998-99
	[In millions of dollars]			
Total	11,994	12,867	13,915	8.1
National Cancer Institute	2,117	2,270	2,478	9.1
National Heart, Lung, and Blood Institute	1,319	1,414	1,584	12.0
National Institute of Allergy and Infectious Diseases	590	629	677	7.7
National Institute of General Medical Sciences	860	929	986	6.2
National Institute of Diabetes and Digestive and Kidney Diseases	771	828	890	7.4
National Institute of Neurological Disorders and Stroke	687	736	794	7.8
National Institute of Mental Health	571	616	662	7.6
National Institute of Child Health and Human Development	547	586	629	7.3
National Institute on Drug Abuse	329	349	383	9.5
National Institute on Aging	468	503	539	7.3
National Center for Research Resources	317	348	399	14.6
National Eye Institute	314	337	365	8.2
National Institute of Environmental Health Sciences	289	311	333	7.1
National Institute of Arthritis and Musculoskeletal and Skin Diseases	244	262	281	7.3
National Institute on Alcohol Abuse and Alcoholism	194	207	223	8.0
National Institute of Dental Research	176	187	204	9.2
National Institute on Deafness and Other Communication Disorders	180	192	206	7.2
National Human Genome Research Institute	183	211	233	10.4
National Library of Medicine	67	74	82	11.5
National Institute of Nursing Research	50	53	57	7.0
John E. Fogarty International Center	16	18	19	8.1
Office of AIDS Research 1/	1,472	1,566	1,691	8.0
Office of the Director	235	240	200	-16.8

1/ The Office of AIDS Research (OAR) was created in FY 1995 to consolidate NIH-wide AIDS research. OAR funds AIDS research in other institutes. AIDS research funded in individual institutes for FYs 1997-98 has been consolidated in the OAR account for comparison purposes.

NOTES: Because of rounding, components may not add to totals. Percentage change derived from unrounded data. Excludes non-R&D and R&D facilities components of institute budgets.

SOURCE: Departmental submission to Office of Management and Budget, MAX Schedule C; and supplemental data obtained from the NIH budget office.

Table 10. Federal R&D budget authority for space research and technology (252): fiscal years 1997-99

Funding category	1997 actual	1998 preliminary	1999 proposed	Percent change 1998-99
	[In millions of dollars]			
Total	7,844	8,265	8,037	-2.8
National Aeronautics and Space Administration (NASA):				
Space Station 1/	2,260	2,654	2,590	-2.4
Other human space flight	81	96	10	-89.6
Space science	2,255	2,308	2,337	1.3
Life and microgravity sciences	492	341	364	6.8
Earth Science 2/	1,504	1,565	1,524	-2.6
Advanced concepts and technology	4	0	0	NA
Space transportation technology	464	541	520	-3.9
Commercial technology	203	187	174	-6.9
Academic programs	138	148	121	-18.4
Mission communication services	443	424	397	-6.5

1/ Includes supplemental transfer authority from other accounts in FY 1998.

2/ Formerly Mission to Planet Earth.

KEY: NA = Not applicable

NOTES: Includes funds for research and research program management, but excludes fixed capital equipment costs. Because of rounding, components may not add to totals. Percentage change derived from unrounded data.

SOURCE: Agencies' submissions to Office of Management and Budget, MAX Schedule C; budget justification documents; and supplemental data obtained from the NASA budget and the NASA budget office.

Table 11. Federal R&D budget authority for general science and basic research (251): fiscal years 1997-99

Funding category	1997 actual	1998 preliminary	1999 proposed	Percent change 1998-99
	[In millions of dollars]			
Total	2,944	4,210	4,649	10.4
National Science Foundation (NSF)	2,248	2,357	2,655	12.6
Mathematical and physical sciences	672	694	770	11.0
Geosciences	420	428	478	11.7
Biological sciences	314	364	411	12.9
Engineering	342	352	394	12.1
Computer and information science and engineering	243	251	300	19.5
U.S. polar research programs	60	61	70	14.5
Social, behavioral, and economic sciences	109	114	133	15.9
Education and human resources	89	93	98	5.8
Budget authority adjustment 1/	-1	0	0	NA
Department of Energy 2/	696	1,853	1,994	7.6
High energy physics	485	521	552	5.9
Nuclear physics	211	225	276	22.3
Basic energy sciences 2/	NA	584	627	7.3
Computational and technology research 2/	NA	143	154	8.3
University and science education 2/	NA	0	15	NA
Multiprogram lab support 2/	NA	0	1	NA
Energy research analyses 2/	NA	1	1	-24.7
Biological and environmental research 2/	NA	378	368	-2.8
Human genome	NA	85	85	0.5
All other research	NA	293	282	-3.8

1/ Detailed R&D funding data for NSF are expressed only in obligations. Budget authority adjustment converts obligations to budget authority.

2/ Beginning in FY 1998, a number of DOE programs were reclassified from energy (270) to general science and basic research (251). See energy (270) for FY 1997 funding levels for these programs.

KEY: NA = Not applicable

NOTES: Because of rounding, components may not add to totals. Percentage change derived from unrounded data.

SOURCE: Agencies' submissions to Office of Management and Budget, MAX Schedule C; budget justification documents; and supplemental data obtained from the agencies' budget offices.

Table 12. Federal R&D budget authority for natural resources and environment (300): fiscal years 1997-99

Funding category	1997 actual	1998 preliminary	1999 proposed	Percent change 1998-99
	[In millions of dollars]			
Total	1,886	2,015	2,013	-0.1
Pollution control and abatement (304)				
Environmental Protection Agency	570	641	636	-0.9
Science and Technology 1/	535	602	606	0.7
Superfund	31	35	26	-27.1
Leaking underground storage tanks (LUST)	1	1	1	-3.7
Oil spill response research	1	1	1	-8.4
Other accounts	2	2	3	7.1
Conservation and land management (302)	203	208	218	4.9
Forest Service (USDA)	181	188	198	5.4
Department of the Interior 2/	22	20	20	0.0
Recreational resources (303)	162	171	183	7.1
Geological Survey 3/ (Interior)	138	145	157	8.4
National Park Service (Interior)	24	26	26	0.0
Water resources (301)	54	52	50	-3.8
Corps of Engineers (DoD)	44	42	40	-4.8
Bureau of Reclamation (Interior)	10	10	10	0.0
Other natural resources (306)	898	943	926	-1.8
Geological Survey 4/ (Interior)	389	400	409	2.2
National Oceanic and Atmospheric Administration (Commerce)	509	543	518	-4.7

1/ Includes budget authority for R&D transferred from Superfund account.

2/ Includes Bureau of Land Management, Office of Surface Mining and Reclamation, and Minerals Management Service.

3/ Natural resources research formerly funded by the National Biological Service.

4/ National mapping, water resources, and geological research.

NOTES: Because of rounding, components may not add to totals. Percentage change derived from unrounded data.

SOURCE: Agencies' submissions to Office of Management and Budget, MAX Schedule C; budget justification documents; and supplemental data obtained from the agencies' budget offices.

Table 13. Federal R&D budget authority for other natural resources (306): fiscal years 1997-99

Funding category	1997 actual	1998 preliminary	1999 proposed	Percent change 1998-99
	[In millions of dollars]			
Total	898	943	926	-1.8
U.S. Geological Survey (Interior)	389	400	409	2.2
Geologic and mineral resource surveys and mapping	229	235	234	-0.6
Water resources investigations	136	136	148	8.7
National mapping, geography, and survey	24	29	27	-6.0
National Oceanic and Atmospheric Administration (Commerce)	509	543	518	-4.7
Oceanic and atmospheric research	221	235	227	-3.6
Climate and air quality	104	110	118	7.3
All other research	117	125	109	-13.2
National Marine Fisheries Services	208	237	223	-5.9
Fishery products promotion and development 1/	0	4	4	0.0
All other research	208	233	219	-5.9
National Ocean Service	25	27	28	1.8
National Weather Service	34	23	18	-21.8
National Environmental Satellite, Data, and Information Service	8	8	8	0.0
Program support	9	9	10	1.1
Fleet modernization, shipbuilding, and conversion	5	3	5	46.7

1/ Actual functional code is 376, other advancement of commerce.

NOTES: Because of rounding, components may not add to totals. Percentage change derived from data.

SOURCE: Agencies' submissions to Office of Management and Budget, MAX Schedule C; budget justification documents; and supplemental data obtained from the agencies' budget offices.

Table 14. Federal R&D budget authority for transportation (400): fiscal years 1997-99

Funding category	1997 actual	1998 preliminary	1999 proposed	Percent change 1998-99
	[In millions of dollars]			
Total	1,785	1,920	1,904	-0.8
Air transportation (402)	1,430	1,492	1,467	-1.7
National Aeronautics and Space Administration 1/	1,194	1,264	1,147	-9.3
Aeronautical research and technology	1,194	1,264	1,147	-9.3
Federal Aviation Administration (DOT)	236	228	320	40.4
Ground transportation (DOT) (401)	324	399	407	2.0
Federal Highway Administration	249	316	323	2.2
National Highway Traffic Safety Administration	39	47	51	8.5
Federal Railroad Administration	20	20	20	0.0
Federal Transit Administration	16	16	13	-18.8
Water transportation (DOT) (403)	19	20	19	-5.0
U.S. Coast Guard	19	20	19	-5.0
Maritime Administration	0	0	0	NA
Other transportation (DOT) (407) 2/	12	9	11	22.2

1/ Includes funds for research and research program management.

2/ Includes Office of the Secretary and the Research and Special Programs Administration.

NOTES: Because of rounding, components may not add to totals. Percentage change derived from unrounded data.

KEY: NA = Not applicable

SOURCE: Agencies' submissions to Office of Management and Budget, MAX Schedule C; and supplemental data obtained from the agencies' budget offices.

Table 15. Federal R&D budget authority for energy (270): fiscal years 1997-99

Funding category	1997 actual	1998 preliminary	1999 proposed	Percent change 1998-99
	[In millions of dollars]			
Total	2,372	1,143	1,470	28.6
Department of Energy 2/	2,271	1,056	1,393	31.9
Fossil energy (271)	282	173	252	46.3
Clean coal technology 1/	-2	-101	-40	-60.4
Cooperative R&D	5	6	6	-0.1
Petroleum, coal, and gas program	279	268	287	7.0
Energy supply (271)	1,669	527	686	30.1
Nuclear energy	128	58	127	117.3
Magnetic fusion	209	205	207	1.0
Solar and renewables	234	264	352	33.4
Energy research analyses 2/	2	NA	NA	NA
Small business innovative research 2/	79	NA	NA	NA
Basic energy sciences 2/	560	NA	NA	NA
Computational and technology research 2/	141	NA	NA	NA
University and science education 2/	0	NA	NA	NA
Multiprogram lab support 2/	0	NA	NA	NA
Biological and environmental research 2/	316	NA	NA	NA
Human genome	78	NA	NA	NA
All other research	238	NA	NA	NA
Uranium enrichment (271)	0	0	0	NA
Energy conservation (272)	319	356	455	27.8
Tennessee Valley Authority (271)	39	26	24	-7.7
Nuclear Regulatory Commission (276)	62	61	53	-13.1

1/ Fiscal year 1999 budget contains a proposal to cancel $40 million in unspent, previously appropriated funds for Clean Coal Technology. Also, budgets for FYs 1997-98 contained proposals to cancel $2 million and $101 million, respectively, in unspent previously appropriated funds for Clean Coal Technology.

2/ Beginning in FY 1998, a number of DOE programs were reclassified from energy (270) to general science and basic research (251). See general science (251) for FYs 1998-99 funding levels for these programs.

KEY: NA = Not applicable

NOTES: Because of rounding, components may not add to totals. Percentage change derived from unrounded data.

SOURCE: Agencies' submissions to Office of Management and Budget, MAX Schedule C; DOE's budget justification documents; and supplemental data obtained from the agencies' budget offices.

Table 16. Federal R&D budget authority for agriculture (350): fiscal years 1997-99

Funding category	1997 actual	1998 preliminary	1999 proposed	Percent change 1998-99
	[In millions of dollars]			
Total	1,203	1,243	1,272	2.3
Agricultural research and services (352): Department of Agriculture				
Agricultural Research Service	691	719	751	4.5
Research on plant sciences	242	253	260	2.6
Research on commodity conversion and delivery	141	146	152	4.4
Research on animal sciences	114	118	126	6.4
Research on soil, water, and air sciences	87	85	87	2.0
Research on human nutrition	61	70	81	15.7
Integration of agricultural systems	27	28	27	-4.3
Agricultural information and library services	20	18	19	2.1
Cooperative State Research, Education, and Extension Service	405	413	406	-1.9
National Research Initiative	94	97	130	33.7
Payments under the Hatch Act	169	169	154	-8.9
Special research grants	55	51	13	-75.6
Improved pest control	10	15	25	64.1
Payments to 1890 colleges and Tuskegee Institute (Evans-Allen)	28	28	28	0.0
McIntire-Stennis cooperative forestry	20	20	20	-3.0
Other research programs	30	33	37	13.3
Economic Research Service	53	72	56	-22.0
Animal & Plant Health Inspection Service	20	20	18	-5.5
National Agricultural Statistics Service	3	3	3	-0.9
Agricultural Marketing Service	5	5	5	2.0
Federal Grain Inspection Service	3	3	3	2.4
Foreign Agricultural Service	2	1	1	0.0
Alternative Agricultural Research and Commercialization	7	7	10	42.9
Office of the Secretary	14	0	18	NA

KEY: NA = Not applicable

NOTE: Because of rounding, components may not add to totals. Percentage change derived from unrounded data.

SOURCE: USDA's submission to Office of Management and Budget, MAX Schedule C; budget justification documents; and supplemental data obtained from the USDA budget office.

Table 17. Federal R&D budget authority for commerce and housing credit (370): fiscal years 1997-99

Funding category	1997 actual	1998 preliminary	1999 proposed	Percent change 1998-99
	[In millions of dollars]			
Total	409	385	465	20.7
Other advancement of commerce (376):				
Department of Commerce				
National Institute of Standards and Technology (NIST)	398	377	455	20.6
Electronics and electrical engineering	36	36	38	6.3
Manufacturing engineering	18	18	19	2.1
Chemical science and technology	32	32	38	18.6
Physics	25	25	26	1.9
Materials science	37	37	37	0.7
Building and fire research	12	16	15	-6.7
Computer systems and applied mathematics	42	42	43	1.8
Technology assistance	2	2	2	10.9
Research support activities	18	18	18	3.5
Deduct R&D capital equipment	-20	-20	-20	0.0
Industrial technology services				
Advanced Technology Program	195	170	238	39.9
Technology Administration	2	0	0	NA
Bureau of the Census	4	4	6	50.0
National Telecommunications and Information Administration	5	4	4	0.0

KEY: NA = Not applicable

NOTES: Because of rounding, components may not add to totals. Percentage change derived from unrounded data.

SOURCE: Departmental submission to Office of Management and Budget, MAX Schedule C; and supplemental data obtained from the agencies' budget offices.

Table 18. Federal R&D budget authority for education, training, employment, and social services (500): fiscal years 1997-99

Funding category	1997 actual	1998 preliminary	1999 proposed	Percent change 1998-99
	[In millions of dollars]			
Total	373	437	454	3.9
Research and general education aids (501, 502, 503)	234	254	312	22.8
Department of Education programs	97	113	163	44.2
Smithsonian Institution programs	137	141	149	5.7
Social services (506)	110	118	114	-3.4
Administration for Children and Families (DHHS)	14	19	16	-15.8
Administration on Aging (DHHS)	8	6	6	0.0
Rehabilitation services (Education)	88	93	92	-1.1
Training and employment (504) (Labor's Employment and Training Admin.)	29	65	28	-56.9
Other labor services (505) (Labor)	0	0	0	NA

KEY: NA = Not applicable

NOTES: Because of rounding, components may not add to totals. Percentage change derived from unrounded data.

SOURCE: Agencies' submissions to Office of Management and Budget, MAX Schedule C; and supplemental data obtained from the agencies' budget offices.

Table 19. Federal R&D budget authority for veterans benefits and services (700): fiscal years 1997-99

Funding category	1997 actual	1998 preliminary	1999 proposed	Percent change 1998-99
	[In millions of dollars]			
Total	267	276	304	10.1
Department of Veterans Affairs (VA) Medical and prosthetic research (703)	267	276	304	10.1

NOTE: Includes administration and operating expenses related to the VA's research.

SOURCE: Departmental submission to Office of Management and Budget, MAX Schedule C.

Table 20. Federal R&D budget authority for the Agency for International Development (AID) and other international programs (150): fiscal years 1997-99

Funding category	1997 actual	1998 preliminary	1999 proposed	Percent change 1998-99
	[In millions of dollars]			
Total (150)	190	171	175	2.3
Agency for International Development (AID) (151):	169	150	154	2.7
International Security Assistance (152)	21	21	21	0.0

NOTES: Because of rounding, components may not add to totals. Percentage change derived from unrounded data.

SOURCE: AID submission to Office of Management and Budget, MAX Schedule C; and supplemental data obtained from the AID budget office.

Table 21. Federal R&D budget authority for administration of justice (750): fiscal years 1997-99

Funding category	1997 actual	1998 preliminary	1999 proposed	Percent change 1998-99
	[In millions of dollars]			
Total	59	76	71	-6.6
Department of Justice	48	65	60	-7.7
Office of Justice Programs (754)	45	62	57	-8.1
Federal Bureau of Investigation (751)	2	2	2	0.0
Federal Prison System (753)	0	0	0	NA
Drug Enforcement Administration (751)	0	0	0	NA
Immigration and Naturalization Service (751)	1	1	1	0.0
Department of the Treasury	11	11	11	0.0
U.S. Customs Service (751)	11	11	11	0.0

KEY: NA = Not applicable

NOTES: Because of rounding, components may not add to the totals shown. Percentage change is derived from unrounded data

SOURCE: Agencies' submissions to Office of Management and Budget, MAX Schedule C; and supplemental data obtained from the agencies' budget offices.

Table 22. Federal R&D budget authority for community and regional development (450): fiscal years 1997-99

Funding category	1997 actual	1998 preliminary	1999 proposed	Percent change 1998-99
	[In millions of dollars]			
Total	48	49	62	26.5
Tennessee Valley Authority (452)	13	11	11	0.0
Department of Housing and Urban Development (451)	34	37	50	35.1
Department of Commerce Economic Development Administration (452)	1	1	1	0.0

NOTES: Because of rounding, components may not add to the totals shown. Percentage change is derived from unrounded d

SOURCE: Agencies' submissions to Office of Management and Budget, MAX Schedule C; and supplemental data obtained from the agencies' budget offices.

Table 23. Federal R&D budget authority for income security (600): fiscal years 1997-99

Funding category	1997 actual	1998 preliminary	1999 proposed	Percent change 1998-99
	[In millions of dollars]			
Total	9	19	30	57.9
Social Security Administration 1/	8	18	30	66.7
Department of Labor	1	1	0	-100.0
Pension Benefit Guarantee Corporation (601)	1	1	0	-100.0

1/ Actual functional code is 650, Social Security.

NOTES: Because of rounding, components may not add to the totals shown. Percentage change is derived from unrounded data.

SOURCE: Agencies' submissions to Office of Management and Budget, MAX Schedule C; and supplemental data obtained from the agencies' budget offices.

Table 24. Federal R&D budget authority for general government (800): fiscal years 1997-99

Funding category	1997 actual	1998 preliminary	1999 proposed	Percent change 1998-99
	[In millions of dollars]			
Total	2	2	2	0.0
Department of Treasury				
Engraving and Printing (803)	2	2	2	0.0

NOTE: Percentage change is derived from unrounded data.

SOURCE: Agencies' submissions to Office of Management and Budget, MAX Schedule C; and supplemental data obtained from the agencies' budget offices.

HISTORICAL TABLES

Table 25a. Federal R&D obligations, by selected budget function: fiscal years 1955-60

[In millions of dollars]

Budget function	1955	1956	1957	1958	1959	1960
Total	2,533	2,988	3,932	4,570	6,694	7,522
National defense	2,151	2,535	3,327	3,801	5,556	6,107
Health	67	83	140	177	233	305
All other functions	315	370	465	592	904	1,140
	[In millions of constant FY 1992 dollars]					
Total	12,552	14,297	18,120	20,549	29,398	32,269
National defense	10,659	12,129	15,332	17,091	24,401	26,199
Health	332	397	645	796	1,023	1,308
All other functions	1,561	1,770	2,143	2,662	3,970	4,891

NOTES: Because of rounding, components may not add to the totals shown. GDP implicit price deflators used to convert current dollars to constant 1992 dollars.

SOURCE: Agencies' submissions to Office of Management and Budget Circular No. A-11, Exhibit 44A, "Research and Development Activities"; and supplemental data obtained from the agencies' budget offices.

Table 25b. Federal R&D obligations, by selected budget function: fiscal years 1961-66

[In millions of dollars]

Budget function	1961	1962	1963	1964	1965	1966
Total	9,059	10,290	12,495	14,225	14,614	15,320
National defense	7,005	7,238	7,764	7,829	7,342	7,536
Health	405	551	626	728	792	900
Space research and technology	777	1,413	2,812	4,241	4,887	4,976
Energy	373	448	515	571	585	575
General science	137	187	246	277	304	377
Natural resources and environment	73	108	120	134	159	189
Transportation	55	101	142	122	147	251
Agriculture	125	136	146	165	195	201
All other functions	108	107	125	160	203	315
	[In millions of constant FY 1992 dollars]					
Total	38,272	43,036	51,590	58,014	58,597	60,126
National defense	29,594	30,272	32,056	31,929	29,439	29,576
Health	1,711	2,304	2,585	2,969	3,176	3,532
Space research and technology	3,283	5,910	11,610	17,296	19,595	19,529
Energy	1,576	1,874	2,126	2,329	2,346	2,257
General science	579	782	1,016	1,130	1,219	1,480
Natural resources and environment	308	452	495	546	638	742
Transportation	232	422	586	498	589	985
Agriculture	528	569	603	673	782	789
All other functions	456	448	516	653	814	1,236

NOTES: Because of rounding, components may not add to the totals shown. GDP implicit price deflators used to convert current dollars constant 1992 dollars.

SOURCE: Agencies' submissions to Office of Management and Budget Circular No. A-11, Exhibit 44A, "Research and Development Activities"; and supplemental data obtained from the agencies' budget offices.

Table 25c. Federal R&D obligations, by budget function: fiscal years 1967-72

[In millions of dollars]

Budget function	1967	1968	1969	1970	1971	1972
Total	16,529	15,921	15,641	15,339	15,543	16,496
National defense	8,566	8,275	8,356	7,981	8,110	8,902
Health	915	1,021	1,088	1,084	1,288	1,547
Space research and technology	4,778	4,304	3,799	3,606	3,048	2,932
Energy	600	657	597	574	556	574
General science	409	437	433	452	513	625
Natural resources and environment	320	331	323	340	416	479
Transportation	380	304	404	535	728	558
Agriculture	218	217	221	238	259	294
Education, training, employment, and social services	154	166	169	164	215	235
International affairs	18	17	26	32	32	29
Veterans benefits and services	41	45	50	59	63	69
Commerce and housing credit	43	48	54	79	90	50
Community and regional development	37	44	32	47	65	66
Administration of justice	1/	1	5	9	10	23
Income security	48	50	78	136	145	106
General government	3	5	5	6	7	8
	[In millions of constant FY 1992 dollars]					
Total	62,776	58,340	54,861	51,113	49,265	49,897
National defense	32,533	30,322	29,309	26,594	25,705	26,927
Health	3,475	3,741	3,816	3,612	4,082	4,679
Space research and technology	18,147	15,771	13,325	12,016	9,661	8,869
Energy	2,279	2,407	2,094	1,913	1,762	1,736
General science	1,553	1,601	1,519	1,506	1,626	1,891
Natural resources and environment	1,215	1,213	1,133	1,133	1,319	1,449
Transportation	1,443	1,114	1,417	1,783	2,307	1,688
Agriculture	828	795	775	793	821	889
Education, training, employment, and social services	585	608	593	546	681	711
International affairs	68	62	91	107	101	88
Veterans benefits and services	156	165	175	197	200	209
Commerce and housing credit	163	176	189	263	285	151
Community and regional development	141	161	112	157	206	200
Administration of justice	1/	4	18	30	32	70
Income security	182	183	274	453	460	321
General government	11	18	18	20	22	24

1/ Less than $500,000

NOTES: Because of rounding, components may not add to the totals shown. GDP implicit price deflators used to convert current dollars to constant 1992 dollars.

SOURCE: Agencies' submissions to Office of Management and Budget Circular No. A-11, Exhibit 44A, "Research and Development Activities"; and supplemental data obtained from the agencies' budget offices.

Table 25d. Federal R&D obligations, by budget function: fiscal years 1973-77

[In millions of dollars]

Budget function	1973	1974	1975	1976	1977
Total	16,800	17,410	19,039	20,780	23,450
National defense	9,002	9,016	9,679	10,430	11,864
Health	1,585	2,069	2,170	2,351	2,629
Space research and technology	2,824	2,702	2,764	3,130	2,832
Energy	630	759	1,363	1,649	2,562
General science	658	749	813	858	974
Natural resources and environment	554	516	624	683	753
Transportation	572	693	635	631	708
Agriculture	308	313	342	383	457
Education, training, employment, and social services	290	236	239	255	230
International affairs	28	24	29	42	66
Veterans benefits and services	74	85	95	98	107
Commerce and housing credit	50	51	65	69	71
Community and regional development	78	82	93	109	101
Administration of justice	33	35	44	35	30
Income security	106	71	72	48	55
General government	7	9	12	12	13
	[In millions of constant FY 1992 dollars]				
Total	48,696	47,105	46,687	47,519	49,872
National defense	26,093	24,394	23,735	23,851	25,232
Health	4,594	5,598	5,321	5,376	5,591
Space research and technology	8,186	7,311	6,778	7,158	6,023
Energy	1,826	2,054	3,342	3,771	5,449
General science	1,907	2,027	1,994	1,962	2,071
Natural resources and environment	1,606	1,396	1,530	1,562	1,601
Transportation	1,658	1,875	1,557	1,443	1,506
Agriculture	893	847	839	876	972
Education, training, employment, and social services	841	639	586	583	489
International affairs	81	65	71	96	140
Veterans benefits and services	214	230	233	224	228
Commerce and housing credit	145	138	159	158	151
Community and regional development	226	222	228	249	215
Administration of justice	96	95	108	80	64
Income security	307	192	177	110	117
General government	20	24	29	27	28

NOTES: Because of rounding, components may not add to the totals shown. GDP implicit price deflators used to convert current dollars to constant 1992 dollars.

SOURCE: Agencies' submissions to Office of Management and Budget Circular No. A-11, Exhibit 44A, "Research and Development Activities"; and supplemental data obtained from the agencies' budget offices.

Table 25e. Federal R&D budget authority, by budget function: fiscal years 1978-83

[In millions of dollars]

Budget function	1978	1979	1980	1981	1982	1983
Total	25,976	28,208	29,739	33,735	36,115	38,768
National defense	12,899	13,791	14,946	18,413	22,070	24,936
Health	2,968	3,401	3,694	3,871	3,869	4,298
Space research and technology	2,939	3,136	2,738	3,111	2,584	2,134
Energy	3,134	3,461	3,603	3,501	3,012	2,578
General science	1,050	1,119	1,233	1,340	1,359	1,502
Natural resources and environment	904	1,010	999	1,061	965	952
Transportation	768	798	887	869	791	876
Agriculture	501	552	585	659	693	745
Education, training, employment and social services	345	354	468	298	228	189
International affairs	57	117	125	160	165	177
Veterans benefits and services	111	123	126	143	139	157
Commerce and housing credit	77	93	101	106	104	107
Community and regional development	92	127	119	104	63	44
Administration of justice	44	47	45	34	31	37
Income security	67	57	47	43	32	32
General government	20	23	22	22	10	6
	[In millions of constant FY 1992 dollars]					
Total	51,652	51,777	50,108	51,773	51,770	53,121
National defense	25,649	25,314	25,183	28,258	31,637	34,168
Health	5,902	6,243	6,224	5,941	5,546	5,889
Space research and technology	5,844	5,756	4,613	4,774	3,704	2,924
Energy	6,232	6,353	6,071	5,373	4,318	3,532
General science	2,088	2,054	2,078	2,056	1,948	2,058
Natural resources and environment	1,798	1,854	1,683	1,628	1,383	1,304
Transportation	1,527	1,465	1,495	1,334	1,134	1,200
Agriculture	996	1,013	986	1,011	993	1,021
Education, training, employment and social services	686	650	789	457	327	259
International affairs	113	215	211	246	237	243
Veterans benefits and services	221	226	212	219	199	215
Commerce and housing credit	153	171	170	163	149	147
Community and regional development	183	233	201	160	90	60
Administration of justice	87	86	76	52	44	51
Income security	133	105	79	66	46	44
General government	40	42	37	34	14	8

NOTES: Because of rounding, components may not add to the totals shown. GDP implicit price deflators used to convert current dollars to constant 1992 dollars.

SOURCE: Agencies' submissions to Office of Management and Budget Circular No. A-11, Exhibit 44A, "Research and Development Activities"; and supplemental data obtained from the agencies' budget offices.

Table 25f. Federal R&D budget authority, by budget function: fiscal years 1984-89

[In millions of dollars]

Budget function	1984	1985	1986	1987	1988	1989
Total	44,214	49,887	53,249	57,069	59,106	62,115
National defense	29,287	33,698	36,926	39,152	40,099	40,665
Health	4,779	5,418	5,565	6,556	7,076	7,773
Space research and technology	2,300	2,725	2,894	3,398	3,683	4,555
Energy	2,581	2,389	2,286	2,053	2,126	2,419
General science	1,676	1,862	1,873	2,042	2,160	2,373
Natural resources and environment	963	1,059	1,062	1,133	1,160	1,255
Transportation	1,040	1,030	917	908	896	1,064
Agriculture	762	836	815	822	882	907
Education, training, employment and social services	200	220	248	267	285	347
International affairs	192	210	211	223	224	279
Veterans benefits and services	218	193	183	215	195	212
Commerce and housing credit	110	114	111	110	122	128
Community and regional development	46	50	88	99	108	74
Administration of justice	24	47	41	49	51	45
Income security	26	21	14	25	23	27
General government	8	17	14	17	17	15
	[In millions of constant FY 1992 dollars]					
Total	58,345	63,623	66,058	68,808	68,880	69,449
National defense	38,647	42,977	45,808	47,205	46,730	45,466
Health	6,306	6,910	6,904	7,905	8,246	8,691
Space research and technology	3,035	3,475	3,590	4,097	4,292	5,093
Energy	3,406	3,047	2,836	2,475	2,478	2,705
General science	2,212	2,375	2,324	2,462	2,517	2,653
Natural resources and environment	1,271	1,351	1,317	1,366	1,352	1,403
Transportation	1,372	1,314	1,138	1,095	1,044	1,190
Agriculture	1,006	1,066	1,011	991	1,028	1,014
Education, training, employment and social services	264	281	308	322	332	388
International affairs	253	268	262	269	261	312
Veterans benefits and services	288	246	227	259	227	237
Commerce and housing credit	145	145	138	133	142	143
Community and regional development	61	64	109	119	126	83
Administration of justice	32	60	51	59	59	50
Income security	34	27	17	30	27	30
General government	11	22	17	20	20	17

NOTES: Because of rounding, components may not add to the totals shown. GDP implicit price deflators used to convert current dollars to constant 1992 dollars.

SOURCE: Agencies' submissions to Office of Management and Budget Circular No. A-11, Exhibit 44A, "Research and Development Activities"; and supplemental data obtained from the agencies' budget offices.

Table 25g. Federal R&D budget authority, by budget function: fiscal years 1990-99

[In millions of dollars]

Budget function	1990	1991	1992	1993	1994	1995	1996	1997	prelimin. 1998	proposed 1999
Total	63,781	65,898	68,398	69,884	68,331	68,791	69,049	71,653	73,639	75,229
National defense	39,925	39,328	40,061	41,249	37,764	37,204	37,801	39,591	39,871	39,699
Health	8,308	9,226	10,055	10,280	10,993	11,407	11,867	12,670	13,557	14,622
Space research and technology	5,765	6,511	6,744	6,988	7,414	7,916	7,844	7,844	8,265	8,037
Energy 1/	2,726	2,953	3,153	2,677	2,873	2,844	2,521	2,372	1,143	1,470
General science 1/	2,410	2,635	2,659	2,691	2,712	2,794	2,846	2,944	4,210	4,649
Natural resources and environment	1,386	1,582	1,688	1,802	2,062	1,988	1,802	1,886	2,015	2,013
Transportation	1,045	1,231	1,523	1,703	1,888	1,833	1,795	1,785	1,920	1,904
Agriculture	950	1,052	1,155	1,152	1,193	1,194	1,176	1,203	1,243	1,272
Education, training, employment, and social services	374	433	365	348	373	369	331	373	437	454
International affairs	375	378	371	382	254	287	252	190	171	175
Veterans benefits and services	216	219	245	250	265	257	259	267	276	304
Commerce and housing credit	140	178	192	220	380	525	432	409	385	465
Community and regional develop	67	88	95	57	68	70	50	48	49	62
Administration of justice	44	51	51	49	46	59	56	59	76	71
Income security	33	30	37	36	45	43	16	9	19	30
General government	17	4	4	2/	0	1	2	2	2	2

[In millions of constant FY 1992 dollars]

	1990	1991	1992	1993	1994	1995	1996	1997	prelimin. 1998	proposed 1999
Total	68,471	67,831	68,398	68,087	65,003	63,802	62,596	63,556	64,101	64,199
National defense	42,861	40,482	40,061	40,188	35,925	34,505	34,268	35,117	34,707	33,879
Health	8,919	9,497	10,055	10,015	10,458	10,580	10,758	11,239	11,801	12,478
Space research and technology	6,189	6,701	6,744	6,808	7,053	7,342	7,111	6,958	7,195	6,859
Energy 1/	2,926	3,040	3,153	2,608	2,733	2,638	2,285	2,104	995	1,254
General science 1/	2,587	2,712	2,659	2,621	2,579	2,591	2,580	2,612	3,665	3,967
Natural resources and environment	1,488	1,628	1,688	1,755	1,962	1,844	1,633	1,673	1,754	1,718
Transportation	1,122	1,267	1,523	1,660	1,796	1,700	1,627	1,584	1,671	1,625
Agriculture	1,020	1,083	1,155	1,122	1,135	1,107	1,066	1,067	1,082	1,085
Education, training, employment, and social services	402	446	365	339	355	342	300	331	380	387
International affairs	403	389	371	372	242	266	228	169	149	149
Veterans benefits and services	232	226	245	244	252	238	235	237	240	259
Commerce and housing credit	150	184	192	214	362	487	391	362	335	397
Community and regional develop	72	91	95	56	64	65	45	43	43	53
Administration of justice	47	52	51	48	44	55	51	52	66	61
Income security	35	31	37	35	43	40	15	8	17	26
General government	18	4	4	2/	0	1	2	2	2	2

1/ Beginning in FY 1998, a number of DOE programs were reclassified from energy (270).

2/ Less than $500,000.

NOTES: Data for 1990-97 are actual budget authority. Data for 1998 are preliminary estimates, and data for 1999 are proposed based on the fiscal year 1999 budget.

SOURCE: Agencies' submissions to Office of Management and Budget, MAX Schedule C; agency budget justification documents; and supplemental data obtained from the agencies' budget offices.

Table 26a. Federal budget authority for basic research, by budget function: fiscal years 1978-83

[In millions of dollars]

Budget function	1978	1979	1980	1981	1982	1983
Total	3,665	4,108	4,716	5,107	5,305	6,247
Health	1,246	1,579	1,761	1,951	1,953	2,475
General science	962	1,026	1,152	1,256	1,296	1,439
Space research and technology	412	440	482	445	434	501
National defense	320	365	552	610	696	788
Energy	157	172	200	220	260	320
Agriculture	197	222	246	281	295	326
Natural resources and environment	207	131	136	131	139	156
Transportation	70	75	79	89	102	117
Education, training, employment, and social services	57	59	61	66	78	70
Commerce and housing credit	9	10	15	17	17	19
Veterans benefits and services	9	10	14	15	13	14
Administration of justice	10	10	9	5	4	4
Community and regional development	8	8	8	5	7	6
General government	0	1/	1/	3	2	3
International affairs	1/	0	0	12	10	10
Income security	2	1	1	3	0	0
	[In millions of constant FY 1992 dollars]					
Total	7,288	7,540	7,946	7,838	7,605	8,560
Health	2,478	2,898	2,967	2,994	2,800	3,391
General science	1,913	1,883	1,941	1,928	1,858	1,972
Space research and technology	819	808	812	683	622	686
National defense	636	670	930	936	998	1,080
Energy	312	316	337	338	373	438
Agriculture	392	407	414	431	423	447
Natural resources and environment	412	240	229	201	199	214
Transportation	139	138	133	137	146	160
Education, training, employment, and social services	113	108	103	101	112	96
Commerce and housing credit	18	18	25	26	24	26
Veterans benefits and services	18	18	24	23	19	19
Administration of justice	20	18	15	8	6	5
Community and regional development	16	15	13	8	10	8
General government	0	1/	1/	5	3	4
International affairs	1/	0	0	18	14	14
Income security	4	2	2	5	0	0

1/ Less than $500,000

NOTES: Because of rounding, components may not add to the totals shown. GDP implicit price deflators used to convert current dollars to constant 1992 dollars.

SOURCE: Agencies' submissions to Office of Management and Budget Circular No. A-11, Exhibit 44A, "Research and Development Activities"; agency budget justification documents; and supplemental data obtained from the agencies' budget offices.

Table 26b. Federal budget authority for basic research, by budget function: fiscal years 1984-89

[In millions of dollars]

Budget function	1984	1985	1986	1987	1988	1989
Total	7,072	7,810	8,193	9,021	9,553	10,648
Health	2,813	3,243	3,324	3,851	4,087	4,413
General science	1,606	1,779	1,795	1,942	2,061	2,265
Space research and technology	646	498	737	843	944	1,099
National defense	845	856	960	900	905	965
Energy	365	428	456	511	571	703
Agriculture	353	406	390	397	428	433
Natural resources and environment	192	206	204	206	210	331
Transportation	125	255	184	231	197	287
Education, training, employment, and social services	77	86	83	78	83	92
Commerce and housing credit	20	23	26	26	28	29
Veterans benefits and services	15	15	15	17	17	16
Administration of justice	5	4	5	8	8	7
Community and regional development	5	6	6	4	7	3
General government	3	4	5	4	5	3
International affairs	3	4	5	3	3	3
Income security	0	0	0	0	0	0
	[In millions of constant FY 1992 dollars]					
Total	9,332	9,960	10,164	10,877	11,133	11,905
Health	3,712	4,136	4,124	4,643	4,763	4,934
General science	2,119	2,269	2,227	2,341	2,402	2,532
Space research and technology	852	635	914	1,016	1,100	1,229
National defense	1,115	1,092	1,191	1,085	1,055	1,079
Energy	482	546	566	616	665	786
Agriculture	466	518	484	479	499	484
Natural resources and environment	253	263	253	248	245	370
Transportation	165	325	228	279	230	321
Education, training, employment, and social services	102	110	103	94	97	103
Commerce and housing credit	26	29	32	31	33	32
Veterans benefits and services	20	19	19	20	20	18
Administration of justice	7	5	6	10	9	8
Community and regional development	7	8	7	5	8	3
General government	4	5	6	5	6	3
International affairs	4	5	6	4	3	3
Income security	0	0	0	0	0	0

NOTES: Because of rounding, components may not add to the totals shown. GDP implicit price deflators used to convert current dollars to constant 1992 dollars.

SOURCE: Agencies' submissions to Office of Management and Budget Circular No. A-11, Exhibit 44A, "Research and Development Activities"; agency budget justification documents; and supplemental data obtained from the agencies' budget offices.

Table 26c. Federal budget authority for basic research, by budget function: fiscal years 1990-99

[In millions of dollars]

Budget function	1990	1991	1992	1993	1994	1995	1996	1997	preliminary 1998	proposed 1999
Total	11,288	12,405	12,973	13,440	13,552	13,772	14,442	14,961	15,710	16,917
Health	4,661	5,021	5,506	5,700	5,889	6,068	6,395	6,852	7,361	7,978
General science 1/	2,306	2,526	2,532	2,553	2,542	2,622	2,662	2,753	3,944	4,367
Space research and technology	1,389	1,479	1,499	1,588	1,796	1,614	1,685	1,653	1,658	1,697
National defense	964	1,188	1,147	1,323	1,174	1,181	1,165	1,090	1,099	1,155
Energy 1/	761	878	921	917	921	930	1,182	1,288	257	269
Agriculture	456	486	528	553	567	565	547	548	560	589
Natural resources and environment	336	389	383	376	224	187	147	153	156	164
Transportation	242	246	266	238	220	389	456	420	459	468
Education, training, employment, and social services	106	115	118	121	145	153	140	142	148	157
Commerce and housing credit	31	39	35	34	38	35	37	34	34	37
Veterans benefits and services	16	16	16	16	16	16	13	14	14	15
Administration of justice	9	6	5	5	5	9	12	13	19	20
Community and regional development	3	10	11	10	9	3	0	0	0	0
General government	3	0	0	0	0	0	0	0	0	0
International affairs	4	6	6	8	6	0	2	2	1	1
Income security	0	0	0	0	0	0	0	0	0	0

[In millions of constant FY 1992 dollars]

Budget function	1990	1991	1992	1993	1994	1995	1996	1997	preliminary 1998	proposed 1999
Total	12,118	12,769	12,973	13,094	12,892	12,773	13,093	13,270	13,675	14,437
Health	5,004	5,168	5,506	5,553	5,602	5,628	5,797	6,078	6,407	6,808
General science 1/	2,476	2,600	2,532	2,487	2,418	2,432	2,413	2,442	3,433	3,727
Space research and technology	1,491	1,522	1,499	1,547	1,709	1,497	1,528	1,466	1,444	1,448
National defense	1,035	1,223	1,147	1,289	1,117	1,095	1,056	967	957	985
Energy 1/	817	904	921	893	876	863	1,071	1,142	223	230
Agriculture	490	500	528	539	539	524	496	486	487	503
Natural resources and environment	361	400	383	366	213	173	133	136	136	140
Transportation	260	253	266	232	209	361	413	372	400	399
Education, training, employment, and social services	114	118	118	118	138	142	127	126	129	134
Commerce and housing credit	33	40	35	33	36	32	34	30	30	32
Veterans benefits and services	17	16	16	15	16	15	12	12	12	13
Administration of justice	10	6	5	4	5	8	11	12	17	17
Community and regional development	3	10	11	10	8	3	0	0	0	0
General government	3	0	0	0	0	0	0	0	0	0
International affairs	4	6	6	8	6	0	2	2	1	1
Income security	0	0	0	0	0	0	0	0	0	0

1/ Beginning in FY 1998, a number of DOE programs were reclassified from energy (270) to general science (251).

NOTES: Data for 1990-97 are actual budget authority. Data for 1998 are preliminary estimates, and data for 1999 are proposed based on the fiscal ye 1999 budget. Because of rounding, components may not add to the totals shown.

SOURCE: Agencies' submissions to Office of Management and Budget, MAX Schedule C; agency budget justification documents; and supplemental d obtained from the agencies' budget offices.

Selected Bibliography

American Association for the Advancement of Science. AAAS Report XXIII: *Research and Development FY 1999*. Washington, DC: 1998

American Association for the Advancement of Science. AAAS R&D Budget and Policy Project, *Congressional Action on Research & Development in the FY 1998 Budget*. Washington, DC: 1997

American Institute of Physics. *Bulletin of Science Policy News* (various FYI daily bulletins). Washington, DC: 1998

Office of Management and Budget. *Budget of the United States Government, Appendix, Fiscal Year 1998*

Office of the Federal Registrar, National Archives and Records Administration. *The United States Government Manual* 1997/*98*